MASTER OF SCIENCE
IN
PROGRAM MANAGEMENT

A GOVERNMENT USER'S PERSPECTIVE OF TESTING
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This thesis identifies and offers solutions to many common issues and challenges facing a U.S. Government weapon system developer conducting a Test and Evaluation program using the Major Range and Test Facility Base. White Sands Missile Range was used as an example. Common requirements were addressed from the perspective of a first-time U.S. Government user. The Test and Evaluation process is complicated and requires a good understanding of the Major Range and Test Facility Base structure and basic procedures. This is particularly important for the manager of a relatively small developmental program which does not have an extensive test support infrastructure. Some topics include the Major Range and Test Facility Base organization and responsibilities, White Sands Missile Range organization and capabilities, and the Universal Documentation System. In addition, a presentation of practical lessons-learned from both Major Range and Test Facility Base users and operators provides a valuable resource base for all test program managers.

KEYWORDS: Flight Termination System, Joint Analysis Team, Major Defense Acquisition Program, Major Range and Test Facility Base, Operations Directive, Operations Requirements, Program Introduction, Program Requirements Document, Program Support Plan, Range Commanders Council, Range Environment, Range Safety, Safe and Arm, Statement of Capability, System Test and Analysis Directorate, Target, Test and Evaluation, Test Hardware, Test Planning, Test Schedule, Universal Documentation System, White Sands Missile Range

CAN LEVEL OF INFORMATION SYTEMS INTEROPERABILITY (LISI) IMPROVE DoD C4I SYSTEMS' INTEROPERABILITY?
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Level of Information System Interoperability (LISI) is a maturity model and interactive process for assessing and improving interoperability. The heart of the LISI concept is the formulation of a system "profile" which was created through the web-based LISI tool, Inspector 1.0. LISI considers five increasing levels of sophistication with respect to exchanging and sharing information and services. Each higher level represents a demonstrable increase in capabilities over the previous level of system-to-system interaction. The increase is expressed in terms of four attributes: *Procedures, Applications, Infrastructure, and Data*. LISI Inspector leverages the data captured in the Inspector Survey to generate four primary sets of assessment products to be as LISI management tool: *Interoperability Profiles, Interoperability Assessment Matrices, Interoperability Comparison Tables*, and *Interoperability System Interface Description.* A principal finding of this research is that LISI has potential to improve DOD C4I systems' interoperability

but current LISI tool has to be refined. Also, LISI must continue to evolve and adopt the dynamic nature of military operations, system acquisition, and technology improvements so LISI can be useful in contributing the improvement of DOD C4I systems' interoperability and to achieve the information superiority envisioned by Joint Vision 2010.

KEYWORDS: Level of Information Systems Interoperability (LISI), Overview of LISI, Interoperability, DoD C4I Systems, Interoperability Tool, LISI Tool, LISI Process, Web-based Interoperability Tool, Inspector Survey, Interoperability Improvement

AN ANALYSIS OF THE FEASIBILITY AND BENEFITS OF STANDARDIZING THE MANAGEMENT OF FLIGHT SAFETY CRITICAL PARTS WITHIN THE DEPARTMENT OF DEFENSE

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Flight Safety Critical Parts (FSCP) are parts that if they fail will cause loss of aircraft and possible loss of life. Each Service within DoD has their own practices and procedures for management, acquisition, and categorizing of FSCP, e.g., Flight Safety Parts, Flight Safety Critical Items, Flight Safety Critical Parts, Critical Safety Items, etc. Due to the diversity between Services, there is significant confusion within DoD and private industry regarding the acquisition, management, and disposal of FSCP. Many of the parts identified as FSCP are used on aircraft operated by more than one Service and on civilian aircraft. The Defense Logistics Agency (DLA) manages parts that are common between Services, which include many FSCPs. Management for FSCP that cross component lines, with each Service providing unique specification, is very difficult. Identification, procurement, testing, and management of Flight Safety Parts need to be consistent between Services in order to provide one standard and one face to industry. Standardization of policies and procedures will increase the potential for the procurement of safe reliable FSCP and decrease the risk of selling faulty surplus FSCP to private industry.

KEYWORDS: Flight Safety Part, Flight Safety Critical Parts, Flight Safety Critical Aircraft Parts, Critical Safety Item

TECHNICAL MANAGEMENT OVERSIGHT FRAMEWORK FOR INTERNATIONAL DEFENSE ACQUISITION: PRESENTATION, APPLICATION, AND ANALYSIS

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This research paper proposes a framework for capturing and studying Technical Management Oversight (TMO) knowledge from past and ongoing international programs. Interviews were conducted with key program personnel from several programs to populate the framework with program data. Programs considered were HAWK, ROLAND, LANCE, MEADS, the International Space Station, and MLRS TGW. These programs had various degrees of international participation and various degrees of international coupling. Valuable insights were captured that can be applied to the structure and conduct of ongoing and future international programs. Among other conclusions, it is found that U.S. policy has not kept pace with international programs, the degree of international coupling within a program strongly affects management complexity and it is important to know the customers. Restrictions on technology transfer and release of information dramatically affect TMO. Cost share and work share issues strongly impact TMO, and patience and diplomacy are vital.

KEYWORDS: Technical Management Oversight, International Programs, HAWK, ROLAND, MEADS, International Space Station, MLRS TGW, International Coupling, Technology Transfer, Work Share, System Engineering, Major Defense Acquisition Program, Lessons Learned, Requirements, Risk

CHANGING SUPPLIERS DURING THE TRANSITION FROM DEVELOPMENT TO PRODUCTION

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Changing suppliers of components during the production phase of a weapon system is a challenging task. The task becomes significantly more difficult during the transition from development to production. The Longbow HELLFIRE, JAVELIN, and Army Tactical Missile System-BAT programs have recently experienced changing suppliers during the transition to production phase. A principal finding of this research is the difficulty in identifying the existence of a serious problem with a supplier. Through an examination of specific cases, this thesis identifies critical signals that a Program Manager should be cognizant of, reveals supplier management practices that can lead to supplier failure, and provides valuable insight to the associated challenges and actual resolutions implemented by these programs. Guidelines are provided to assist Program Managers in arriving at the difficult decision that a change in suppliers is preferable to the status quo.

KEYWORDS: Changing Suppliers, Supplier Management, Transition from Development to Production

OPEN SYSTEMS AND COMMERCIAL-OFF-THE-SHELF (COTS) ACQUISITION STRATEGIES FOR LIVE-FIRE TARGETRY

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This research analyzes the implications regarding the application of commercial items and open systems to acquisition strategies for the New Generation Army Targetry System (NGATS). The NGATS is a new program to standardize targetry for the full spectrum of Army qualification and collective live-fire training. The primary task of this thesis is to analyze a real-world program and apply the lessons learned from the literature to that program. The Carnegie Mellon Software Engineering Institute is well represented in the literature and published a document by Patrick Place titled Guidance on Commercial-Based and Open Systems for Program Managers. This guide provides a series of suggestions for the program manager that the researcher uses as the framework for describing and analyzing the NGATS program. The researcher used this framework to take stock of the NGATS program accomplishments, ongoing efforts, and planed activities, and then determined the weak points in the program strategy. This analysis focused on four management themes:

- Closing the expectations gap
- Reinventing evaluation
- Managing configuration changes
- Transforming the program manager's skill set

KEYWORDS: Commercial Items, Commercial-Off-The-Shelf (COTS), COTS, Open Systems, Targets, Targetry

CONTRACTORS ON THE BATTLEFIELD: A CASE STUDY OF THE AIRBORNE RECONNAISSANCE LOW (ARL) LIFE CYCLE LOGISTICS SUPPORT CONTRACT – MARCH 2000 THROUGH SEPTEMBER 2001

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Contractors have consistently contributed to successful military operations. The goal of this thesis is to provide an assessment of the life-cycle logistics support contract for Airborne Reconnaissance Low (ARL). The ARL performs a reconnaissance mission in support of other than military missions. This is not "war" in the traditional sense of the word; however, every deployment presents unique problems associated with the location and the mission.

Based on the developmental nature and unique missions of the ARL, support contracts were originally awarded as "time and material" efforts. However, in December 1999, the Fixed Wing Product Management Office (FWPMO), Aviation and Missile Command (AMCOM), assumed responsibility for the aircraft and awarded a firm-fixed price contract for logistics support. The contract was awarded to Avtel Services, who was the subcontractor on the previous time and material contract. Avtel transitioned into the role of the prime contractor on 1 March 2000. This thesis analyzes the Acquisition Strategy and Contracting Strategy issues encountered when contracting life-cycle logistics support for aging low-density aircraft regularly deployed to austere remote areas.

The conclusions and recommendations of this thesis should benefit government and industry personnel currently operating in or planning to operate in hostile environments.

KEYWORDS: Contractors on the Battlefield, Contractor Logistics Support (CLS), Logistics, Life Cycle Contractor Logistics Support, Aircraft Maintenance, Reconnaissance Aircraft, Fixed Wing Aircraft, Hostile Environment, Deployments, Teaming, Multi-year Contracting

THE REALITY OF ESTIMATING COSTS IN PRODUCTION CONTRACTS

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Government cost estimators develop cost estimates by the use certain tools/models, but often these estimates vary greatly from the contractor's proposals and more importantly, the final contract price. Contractors on the other hand use similar tools/models that result in estimates that are doubled the accuracy level of the Government. The thesis research encompassed surveys and interviews of multifunctional personnel from Government and contractor program offices in an effort to understand the tools and the processes used in the development of cost estimates, the accuracy levels, and the factors that affect the estimates. The research was concentrated on Army missile follow-on production contracts. The data revealed that contractor cost estimators more accurately estimate costs of follow-on production contacts due to the tools, methods and processes they use in acquiring data from their internal personnel as well as from the vendors. The thesis will provide an insight into these methods and processes and will also describe factors that affect cost estimates with real life examples of cases to illustrate the reasons estimates are affected. As a final point, it will provide a set of recommendations that should be beneficial to cost estimators and other program office personnel in gathering information to best ascertain what the best input variables are for cost estimating purposes. The intent of these recommendations is for Government Program

offices to understand the variables that affect estimates and to perhaps use these items as a tool in acquiring data to better generate a Government estimate or to manage a program.

KEYWORDS: Cost Estimating, Independent Government Cost Estimates, Production Contract Costs

THE RELIABILITY CHALLENGE: COMMON PITFALLS, AND STRATEGIES FOR MAXIMIZING INHERENT RELIABILITY OF WEAPON SYSTEMS

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Demonstration of required reliability performance levels prior to system fielding has remained a challenge for the Army, and in recent years, the success rate of systems achieving their stated reliability performance in operational tests has declined. Realization of required reliability performance necessitates effective management strategies and techniques in order to reduce risks. Furthermore, managing reliability performance does not stop upon fielding and must be continually monitored and assessed for potential improvements and efficiencies in support of meeting Army readiness objectives.

The objective of this research is to ascertain common management issues that many Program and Project Managers deal with concerning reliability, identify their root causes, and suggest potential methods for mitigating these risks. To gather these data, the researcher drew directly from experiences of programs within Program Executive Office for Intelligence, Electronic Warfare & Sensors (PEO IEW&S). The programs participating cover the full spectrum of Acquisition Category (ACAT) levels and cross all acquisition phases. Results show that the key to success resides in early identification of upfront cost-effective opportunities for improving reliability performance, and mitigation of associated risks during design, manufacturing development, test, and post-production. Predictability in the field is the desired end state.

KEYWORDS: Reliability, Weapon System, Acquisition, Management

ACQUISITION REFORM: HOW DOES IT WORK? DOES IT WORK FOR INFORMATION TECHNOLOGY (IT) SYSTEMS? A CASE STUDY OF JOINT COMPUTER AIDED LOGISTICS SYSTEM (JCALS)

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After nearly a decade since the initial JCALS contract award, only one of the four DoD Services has Transitioned and Cutover (T&C) their legacy system, is fielded, and currently operates in a production mode. The initial state-of-the-art technologies that were to be delivered reached obsolescence prior to their fielding. Difficulties were encountered in unambiguously defining the user's requirements, and in trying to establish innovative business process re-engineering workflows. The Government "rice bowl" culture was firmly entrenched, policies remained unchallenged, and users were reluctant to abandon and deviate from their accustomed ways of doing business. This resulted in automating some of the Service's antiquated legacy systems, without creating any process efficiencies. Rarely were joint Service software applications developed. The DoDI 5000.2 and DoD 5000.2R endorse tailored and evolutionary acquisitions, but provided no guidance on how to effectively undertake and mange this endeavor for information technology/software-intensive systems. The purpose of this research paper is to study the acquisition reform initiatives used on the JCALS program, and to assess the impacts and effectiveness of these initiatives. The program's developmental contracting and test data, both Government and contractor, shall be evaluated and the resulting interpretations shall be compared and contrasted.

KEYWORDS: Acquisition Reform, Joint Computer Aided Logistics System (JCALS), Best Commercial Practices, Best Contracting Practices, Information Technology Reform Initiative, Defense Acquisition Workforce Improvement Act (DAWIA), PM Tenure, Civilian and Military Workforce Mix, Paperless Contracting, Commercial Standards, Military Specification and Standards Reform, Standard Army Publishing System (STARPUBS), Stakeholder Perceptions, Requirements Interpretations, Air Force Technical Orders Composing Speeds, Software Metrics, Software Maturity, Award Fee Incentives, Electronic Contracting